

mitsubishi

High Speed Data Logger Module

User's Manual
(Hardware)

QD81DL96

Thank you for purchasing the Mitsubishi programmable controller
MELSEC-Q Series.

Prior to use, please read both this manual and detailed manual thoroughly to fully understand the product.

MELSEC-Q
Mitsubishi Programmable
Controller

Model	QD81DL96-U-HW
MODEL CODE	13JY97
IB(NA)-0800441-C(1006)KWIX	

● SAFETY PRECAUTIONS ●

(Always read these precautions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

Note that these precautions apply only to this product.

For the safety precautions of the programmable controller system, please read the User's Manual for the CPU module used.

In this manual, the safety instructions are ranked as "⚠ WARNING" and "⚠ CAUTION".



Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Note that the ⚠ CAUTION level may lead to a serious consequence according to the circumstances.

Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

WARNING

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.
- For the operating status of each station after a communication failure, refer to relevant manuals for the network. Erroneous outputs and malfunctions may lead to accidents.
Not doing so can cause an accident due to false output or malfunction.
- To maintain the safety of the programmable controller system against unauthorized access from external devices via the network, take appropriate measures.
- When changing data of the running programmable controller from a peripheral connected to the CPU module or from a personal computer connected to an intelligent function module or special function module, configure an interlock circuit in the sequence program to ensure that the entire system will always operate safely. For program modification and operating status change, read relevant manuals carefully and ensure the safety before operation.
Especially in the above mentioned control operations that are performed from an external device to a remote programmable controller, any problems on the programmable controller side may not be dealt with promptly due to abnormal data communication. To prevent this, configure an interlock circuit in the sequence program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Do not write any data in the "system area" of the buffer memory in the intelligent function module.
Also, do not use any "use prohibited" signals as an output signal from the programmable controller CPU to the intelligent function module.
Doing so may cause malfunction of the programmable controller system.

[Design Precautions]

CAUTION

- Do not bundle the control wires and the communication cables with the main circuit and the power wires, and do not install them close to each other. They should be installed at least 100 mm (3.94 in.) away from each other. Failure to do so may generate noise that may cause malfunctions.
- During registering each setting, do not power OFF the mounted module or reset the programmable controller CPU.
Otherwise, data in the CompactFlash™ card will be undefined. Therefore, resetting and re-registering data are required.
This may also cause a module failure or malfunctions.

[Installation Precautions]

CAUTION

- Use the programmable controller in an environment that meets the general specifications in the user's manual for the CPU module used. Using the programmable controller in any other operating environments may cause electric shocks, fires or malfunctions, or may damage or degrade the module.
- While pressing the installation lever located at the bottom of module, insert the module fixing tab into the fixing hole in the base unit until it stops. Then, securely mount the module with the fixing hole as a supporting point. If the module is not installed properly, it may cause the module to malfunction, fail or fall off.
Secure the module with screws especially when it is used in an environment where constant vibrations may occur.
Be sure to tighten the screws using the specified torque. If the screws loose, it may cause the module to short-circuit, malfunction or fall off. If the screws are tightened excessively, it may damage the screws and cause the module to short-circuit, malfunction or fall off.
- Before mounting/dismounting the module, be sure to shut off all phases of external power supply used by the system.
Failure to do so may cause product damage.
- Do not directly touch any conductive part or electronic component of the module.
This may cause the module to malfunction or fail.
- Push the CompactFlash™ card into the CompactFlash™ card slot and install it securely.
After installing the CompactFlash™ card, check that it is inserted securely.
Failure to do so may cause malfunctions due to poor contact.

[Wiring Precautions]

CAUTION

- Connectors for external connection must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered.
If the connection is incomplete, it may cause the module to short circuit, catch fire, or malfunction.
- Install connectors securely to modules.
- Make sure to place the communication and power cables to be connected to the module in a duct or fasten them using a clamp. If the cables are not placed in a duct or fastened with a clamp, their positions may be unstable or moved, and they may be pulled inadvertently.
This may damage the module and the cables or cause the module to malfunction because of faulty cable connections.
- When disconnecting the communication and power cables from the module, do not pull the cables by hand. When disconnecting a cable with a connector, hold the connector to the module by hand and pull it out to remove the cable. When disconnecting a cable connected to a terminal block, loosen the screws on the terminal block first before removing the cable. If a cable is pulled while being connected to the module, it may cause the module to malfunction or damage the module and the cable.
- Be careful not to let any foreign matter such as wire chips get inside the module. They may cause fire, as well as breakdowns and malfunctions of the module.
- A protective sheet is pasted on the upper part of the module in order to prevent foreign matter such as wire chips to get inside the module while wiring.
Do not remove this protective sheet during wiring work. However, be sure to remove the protective sheet before operating the module to allow heat radiation during operation.

[Disposal Precautions]



CAUTION

- Dispose of this product as an industrial waste.

● CONDITIONS OF USE FOR THE PRODUCT ●

- (1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
 - ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.
- (2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
- MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.

("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi representative in your region.

Revisions

* The manual number is given on the bottom right of the front cover.

Print date	* Manual number	Revision
Jan., 2009	IB(NA)-0800441-A	First edition
Mar., 2009	IB(NA)-0800441-B	Correction Chapter3,7
Jun., 2010	IB(NA)-0800441-C	Addition CONDITIONS OF USE FOR THE PRODUCT, WARRANTY Correction SAFETY PRECAUTIONS,Chapter3,6

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About Manual

The following manual is also related to this product.
In necessary, order it by quoting the details in the table below.

Related Manual

Manual name	Manual No. (Model code)
High Speed Data Logger Module User's Manual	SH-080818ENG (13JZ30)

Compliance with the EMC and Low Voltage Directives

- (1) For programmable controller system

To configure a system meeting the requirements of the EMC and Low Voltage Directives when incorporating the Mitsubishi programmable controller (EMC and Low Voltage Directives compliant) into other machinery or equipment, refer to Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).
The CE mark, indicating compliance with the EMC and Low Voltage Directives, is printed on the rating plate of the programmable controller.

- (2) For the product

For the compliance of this product with the EMC and Low Voltage Directives, refer to Section 9.1.3 "Cables" in Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

1. OVERVIEW

This manual explains how to install the QD81DL96 high speed data logger module (hereafter, abbreviated as high speed data logger module) and how to wire them with other devices.

(Packing list)

Model	Product name	Quantity
QD81DL96	QD81DL96 High speed data logger module *1	1

*1 : A battery is not required for the high speed data logger module.

2. PERFORMAMNCE SPECIFICATIONS

The following describes the performance specifications of the high speed data logger module.

For general specifications of the high speed data logger module, refer to the following manual.

☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection)

Item		Specifications	
Ethernet	Interface ^{*1}	10BASE-T	100BASE-TX
	Data transmission rate	10 Mbps	100 Mbps
	Transmission method	Base band	
	No. of cascaded stages	Maximum 4 stages	Maximum 2 stages
	Max. segment length ^{*2}	100 m	
	Supported function	The auto-negotiation function is available. (automatically distinguishes 10BASE-T from 100BASE-TX)	
CompactFlash™ card	Supply power voltage	3.3V ± 5%	
	Supply power capacity	Maximum 150 mA	
	Card size	TYPE I card	
	No. of installable cards	1	
Number of occupied I/O points		32 points/slot (I/O assignment: Intelli. 32 points)	
Clock		The clock data are obtained from a programmable controller CPU (in multiple CPU system, CPU No.1) or the SNTP server computer. The clock accuracy after the clock data are obtained: Daily error ± 9.504 seconds ^{*3}	
5VDC internal current consumption		0.46A	
External dimensions		98 (3.86) (H)× 27.4 (1.08) (W)× 90(3.54) (D) [mm (inch)]	
Weight		0.15kg	

*1 : The high speed data logger module distinguishes 10BASE-T from 100BASE-TX depending on the device on other end.

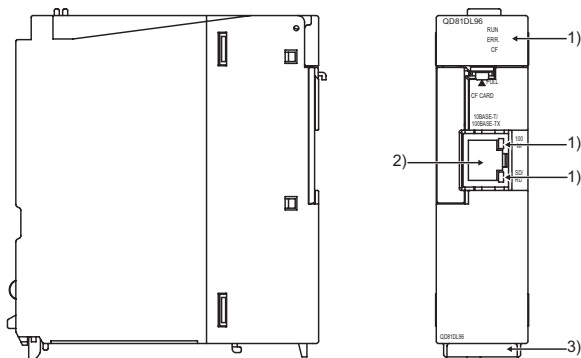
For connection with a hub not having the auto-negotiation function, set the hub side to half-duplex auto communication mode.

*2 : Distance between a hub and node.

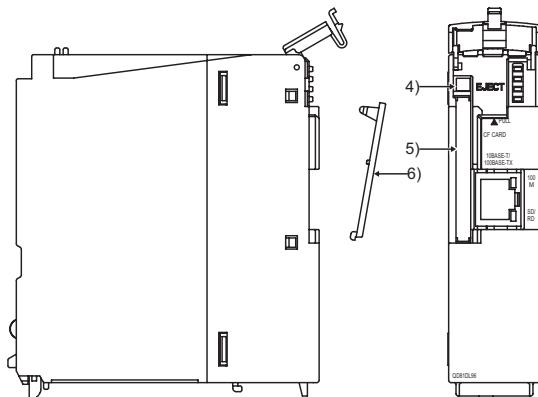
*3 : The clock data are reobtained every 24 hours for a programmable controller CPU, and per user specified cycle for the SNTP server.

3. PART NAMES

(1) With the LED cover closed



(2) With the LED cover open

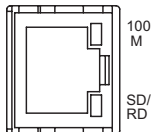
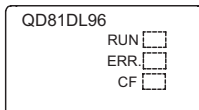


*1 : A battery is not required for the high speed data logger module.

Name		Description
1)	Indicator LED	Refer to (3) Indicator LED display contents.
2)	10BASE-T/100BASE-TX interface connector (RJ45)	Used for connecting the high speed data logger module in 10BASE-T/100BASE-TX connection. (The high speed data logger module distinguishes 10BASE-T from 100BASE-TX depending on the device on other end.)
3)	Serial number plate	Indicate the serial No. of the QD81DL96.
4)	EJECT button	Used for ejecting a CompactFlash™ card from the high speed data logger module.
5)	CompactFlash™ card slot	Used for installing a CompactFlash™ card to the high speed data logger module.
6)	CompactFlash™ card slot cover	Cover for the CompactFlash™ card slot

*1 : A battery is not required for the high speed data logger module.

(3) Indicator LED display contents



Name	LED status	Description
RUN	ON	In normal operation (It may take some time until the RUN LED is turned ON after the module is started.)
	OFF	Watchdog timer error (Hardware error)
	Flash	Module check (Flashes for 10 seconds when the module check button is clicked on the high speed data logger module search screen of the Configuration Tool or the GX LogViewer.)
ERR.	OFF	In normal status
	ON	Module continuation error
	Flash	Module stop error
CF	ON	Accessible to CompactFlash™ card
	OFF	Not accessible to CompactFlash™ card (Removable status)
	Flash	CompactFlash™ card in preparation
100 M	ON	100 Mbps
	OFF	10 Mbps
SD/RD	ON	During data send or data receive
	OFF	Data not transmitted

4. LOADING AND INSTALLATION

4.1 Handling Precautions

- (1) Do not drop or apply severe shock to the module.
- (2) Before touching the module, always touch grounded metal, etc. to discharge static electricity from human body, etc.
Not doing so can cause the module to fail or malfunction.
- (3) Tighten the module fixing screws within the following range.

Screw	Tightening torque range
Module fixing screw(M3 screw)*1	0.36 to 0.48 N•m

*1 : The module can be easily fixed onto the base unit using the hook at the top of the module.

However, it is recommended to secure the module with the module fixing screw if the module is subject to significant vibration.

4.2 Installation Environment

For details, refer to the user's manual for the CPU module used.

5. EXTERNAL WIRING

5.1 Connecting to the 10BASE-T/100BASE-TX

When connecting to the 10BASE-T/100BASE-TX interface, use twisted pair cable.

Use twisted pair cable that meets IEEE802.3 10BASE-T/100BASE-TX standards.

- (1) For 100 Mbps
Either (a) or (b) of the following can be used.
 - (a) Unshielded twisted pair cable (UTP cable), Category 5 or later
 - (b) Shielded twisted pair cable (STP cable), Category 5 or later
- (2) For 10 Mbps
Either (a) or (b) of the following can be used.
 - (a) Unshielded twisted pair cable (UTP cable), Category 3 or later
 - (b) Shielded twisted pair cable (STP cable), Category 3 or later

POINT
<p>During high speed communication (100 Mbps) via 100BASE-TX connection, communication errors may occur due to the effect of high frequency noise generated from the equipment other than programmable controller, depending on the installation environment.</p> <p>Take the following countermeasures on the high speed data logger module side to eliminate the effect of high frequency noise when constructing the network system.</p> <p>(1) Wiring</p> <ul style="list-style-type: none">• Do not install the twisted pair cables together with the main circuit or power lines, or bring them close to each other.• Make sure to place the twisted pair cable in a duct. <p>(2) Cable</p> <ul style="list-style-type: none">• In the environment where the cable is susceptible to noise, use the shielded twisted pair cable (STP cable). <p>(3) 10 Mbps communication</p> <ul style="list-style-type: none">• Connect the 10 Mbps-compatible equipment with the high speed data logger module and transmit the data to the equipment at a transmission speed of 10 Mbps.

6. SETTING FROM GX DEVELOPER

The intelligent function module switches are used to make the mode setting, default operation setting, and response monitoring time setting.

Switch number	Description
Switch 1	Mode setting
Switch 2	Default operation setting
Switch 3 (Lower byte)	Response monitoring time setting
Switch 4	Compatibility setting
Switch 5	For system use (Do not set.)

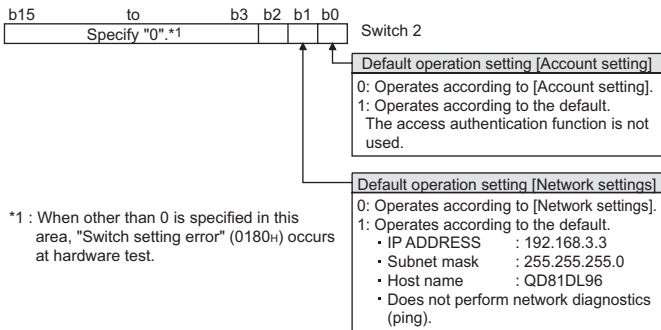
(1) Mode setting (Switch 1)

Select the high speed data logger module operation mode.

Setting number	Item	Description
0000H	Online	Normal operation mode
0001H	Hardware test	Tests the ROM/RAM switch settings.
0002H	Self-loopback test	Executes the 10BASE-T/100BASE-TX interface self-diagnostics test.

(2) Default operation setting (Switch 2)

Select the default operation setting for the high speed data logger module.



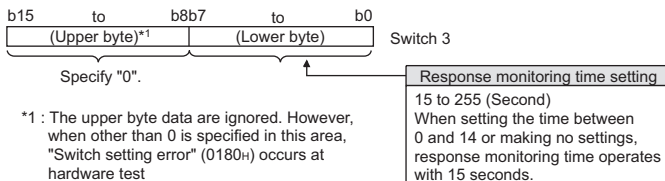
(3) Response monitoring time setting (Switch 3 (Lower byte))

Set the timeout time (Second) from when the high speed data logger module sends a request to the access target CPU until receiving the reply.

A response time-out error (0002H) occurs if the access target CPU does not respond within the set time.

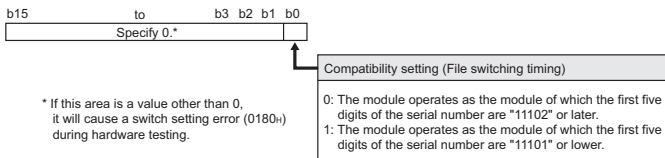
Setting range: 15 to 255 (Second) (Default value: 15 seconds)

When setting the time between 0 and 14 or making no settings, response monitoring time operates with 15 seconds.

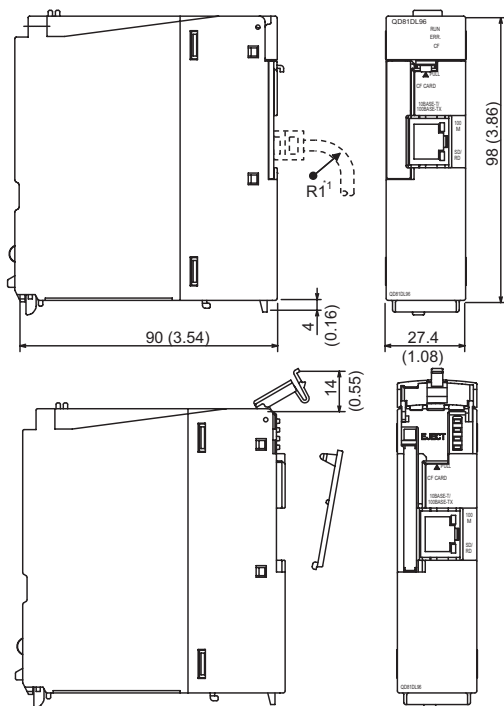


(4) Compatibility setting (Switch 4)

Set this switch to make the process, which may differ depending on a function version (the first five digits of the serial number), the same as that on another function version (the first five digits of the serial number).



7. EXTERNAL DIMENSIONS



(Unit: mm (inch))

- *1 : The bending radius near the connector (R1: yardstick) should be at least four times longer than the cable's outside diameter when the twisted pair cable is connected.

CompactFlash is a trademark of SanDisk Corporation in the United States and other countries.

All other company names and product names used in this manual are trademarks or registered trademarks of their respective companies.

Warranty

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

- (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
- (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
 1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
 2. Failure caused by unapproved modifications, etc., to the product by the user.
 3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
 4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
 5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
 6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
 7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

- (1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
- (2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

Country/Region Sales office/Tel

U.S.A Mitsubishi Electric Automation Inc.
500 Corporate Woods Parkway Vernon
Hills, IL 60061, U.S.A.
Tel : +1-847-478-2100

Brazil MELCO-TEC Rep. Com.e Assessoria
Tecnica Ltda.
Rua Correia Dias, 184,
Edificio Paraiso Trade Center-8 andar
Paraiso, Sao Paulo, SP Brazil
Tel : +55-11-5908-8331

Germany Mitsubishi Electric Europe B.V. German
Branch
Gothaer Strasse 8 D-40880 Ratingen,
GERMANY
Tel : +49-2102-486-0

U.K Mitsubishi Electric Europe B.V. UK
Branch
Travellers Lane, Hatfield, Hertfordshire.,
AL10 8XB, U.K.
Tel : +44-1707-276100

Italy Mitsubishi Electric Europe B.V. Italian
Branch
Centro Dir. Colleoni, Pal. Perseo-Ingr.2
Via Paracelso 12, I-20041 Agrate Brianza.,
Milano, Italy
Tel : +39-039-60531

Spain Mitsubishi Electric Europe B.V. Spanish
Branch
Carretera de Rubi 76-80,
E-08190 Sant Cugat del Valles,
Barcelona, Spain
Tel : +34-93-565-3131

France Mitsubishi Electric Europe B.V. French
Branch
25, Boulevard des Bouvets, F-92741
Nanterre Cedex, France
TEL : +33-1-5568-5568

South Africa Circuit Breaker Industries Ltd.
Private Bag 2016, ZA-1600 Isando,
South Africa
Tel : +27-11-928-2000

Country/Region Sales office/Tel

Hong Kong Mitsubishi Electric Automation
(Hong Kong) Ltd.
10th Floor, Manulife Tower, 169 Electric
Road, North Point, Hong Kong
Tel : +852-2887-8870

China Mitsubishi Electric Automation
(China) Ltd.
4/F Zhi Fu Plaza, No.80 Xin Chang Road,
Shanghai 200003, China
Tel : +86-21-6120-0808

Taiwan Setsuyo Enterprise Co., Ltd.
6F No.105 Wu-Kung 3rd.Rd, Wu-Ku
Hsiang, Taipei Hsine, Taiwan
Tel : +886-2-2299-2499

Korea Mitsubishi Electric Automation Korea Co., Ltd.
1480-6, Gayang-dong, Gangseo-ku
Seoul 157-200, Korea
Tel : +82-2-3660-9552

Singapore Mitsubishi Electric Asia Pte, Ltd.
307 Alexandra Road #05-01/02, Mitsubishi
Electric Building, Singapore 159943
Tel : +65-6470-2460

Thailand Mitsubishi Electric Automation (Thailand)
Co., Ltd.
Bang-Chan Industrial Estate No.111
Moo 4, Serithai Rd, T.Kannayao,
A.Kannayao, Bangkok 10230 Thailand
Tel : +66-2-517-1326

Indonesia P.T. Autoteknindo Sumber Makmur
Muara Karang Selatan, Block A/Utara
No.1 Kav. No.11 Kawasan Industri
Pergudangan Jakarta - Utara 14440,
P.O.Box 5045 Jakarta, 11050 Indonesia
Tel : +62-21-6630833

India Messung Systems Pvt. Ltd.
Electronic Sadan NO.III Unit No15,
M.I.D.C Bhosari, Pune-411026, India
Tel : +91-20-2712-3130

Australia Mitsubishi Electric Australia Pty. Ltd.
348 Victoria Road, Rydalmere,
N.S.W 2116, Australia
Tel : +61-2-9684-7777

**mitsubishi electric corporation**

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14, YADA-MINAMI 5-CHOME, HISASHI-KU, NAGOYA, JAPAN

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